WHAT IS CLAIMED IS:

1). A fuel system for supplying a plurality fuels for use in spark ignition, internal combustion engine having a fuel supply comprising:

a membrane in operable communication with the fuel supply for separating said fuel supply into at least a first fuel and a second fuel in which the first fuel has a RON greater than 100, and an average burn rate greater and a laminar flame speed greater than 105% of isooctane.

means for supplying the first fuel to the engine under high load conditions; and, means for supplying the second fuel to the engine at other than high load conditions.

2). A fuel system for supplying a plurality of unleaded fuels for use in a spark ignition, internal combustion engine having a CR of 11 or more comprising

a fuel supply, a membrane in operable communication with the fuel supply for separating said fuel supply into at least a first fuel , and a second fuel, in which the second fuel has a RON less than 90, and a burn rate and a laminar flame speed greater than 105% of isooctane.

means for supplying the second fuel to the engine at low load conditions; and,

means for supplying the first fuel to the engine at other than low load conditions.

3). A system for supplying in situ formulated fuels boiling in the gasoline range for use in operating a spark ignition, internal combustion engine having a CR of 11 or more comprising:

a fuel supply; a membrane in operable communication with the fuel supply for separating said fuel supply into at least a first fuel and a second fuel, in which the first fuel having a RON greater than about 100 and the second fuel

having a RON less than about 90, both fuels having, an average burn rate greater than 105% of isooctane and a laminar flame speed greater than 105 % of isooctane;

means for supplying at least a portion of the first fuel to the engine at high load condition; and

means for supplying at least a portion of the second fuel to the engine at low load conditions.

4). The fuels system of claim 3 admixing from the first and second fuel in a preselected ratio to obtain a third fuel having a RON between that of the first and second fuel.

5). The fuel system of claim 3 wherein said membrane is selected to preferentially permeate aromatics whereby said first fuel comprise greater than about forty-five volume percent aromatics.

6). The fuel system of claim 5 wherein said fuel supply is a reservoir of gasoline and wherein second fuel comprise less than about forty five percent aromatics.

7). The fuel system of claim 6 wherein said first fuel comprises greater than about fifty five volume percent aromatics.

8). The fuel system of claim 3 wherein said membrane is selected from the group consisting of bisphenol-A polysulphone, polyethersulfone membranes, crosslinked polysulfane membranes, polyamide/polyadiapate, polyimide/polysuccinate. polyimide/polymalonate, polyimide/polyoxalate, polyimide/polyglutarate, polyvinylfluoride and polyvinylene fluoride and composites thereof.

9). The fuel system of claim 8 wherein the membrane is supported.

10). The fuel system of claim 9 including means to control permeate side pressure of the membrane in the range of from about 0.05 bar to about 0.5 bar.

11). The fuel system of claim 10 including means to control retentate side pressure of the membrane in the range of from about 2 bar to about 200 bar.

12). The fuel system of claim 11 wherein the pressure is controlled at from about 3.5 bar to about 15 bar.

13). A method for operating a vehicle having a spark ignition engine to increase the efficiency and reduce the emissions of the engine under conditions of use comprising:

supplying a fuel to a fuel separation means;

separating said fuel into at least first and second fuel;

supplying at least a first fuel to the engine at about high engine load conditions; and

supplying at least a second fuel to the engine at about low engine load conditions,

the first fuel having a RON greater than 100, a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane;

the second fuel having a RON less than 90, a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane; and

whereby engine efficiency is increased and emissions are reduced.

14). The method of claim 16 wherein the fuel separation means is a pervaporation membrane.

15). The fuel system of clam 3 wherein said membrane is selected to preferentially permeate aromatics whereby said second fuel comprises less than about twenty volume percent aromatics.

16). A method for operating a vehicle having a spark ignition engine to increase the efficiency and reduce the emissions of the engine under conditions of use comprising:

supplying a fuel to a fuel separation means;

separating said fuel into at least first and second fuel by means of a membrane that preferentially permeates aromatics.

The first fuel having a RON greater than 100, a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane;

The second fuel having a RON less than 90, a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane; and

supplying at least a first fuel to the engine at about high engine load conditions; and

supplying at least a second fuel to the engine at about low engine load conditions,

whereby engine efficiency is increased and emissions are reduced.

17). The method of claim 16 wherein the fuel separation means is a pervaporation membrane selected from the group consisting of bisphenol-A polysulphone, polyethersulfone membranes, crosslinked polysulfane membranes, polyamide/polyadiapate, polyimide/polysuccinate, polyimide/polymalonate, polyimide/polyoxalate, polyimide/polyglutarate, polyvinylfluoride and polyvinylene fluoride and composites thereof.

18). The method of claim 17 including means for admixing the first fuel and the second fuel in a preselected ratio to obtain a third fuel having a RON between those of the first fuel and the second fuel.